Clinical Pathological Case (CPC)

Seed
GLOBAL HEALTH

CPC
CASE-BASED LEARNING SERIES
"Mastering Emergency Care"

Disclaimer

Clinical Pathological Case training videos are for educational purposes and should not be used as the sole source of reference during patient care. Always refer to official guidelines and consult qualified professionals before applying any practices

Case Based Learning Series

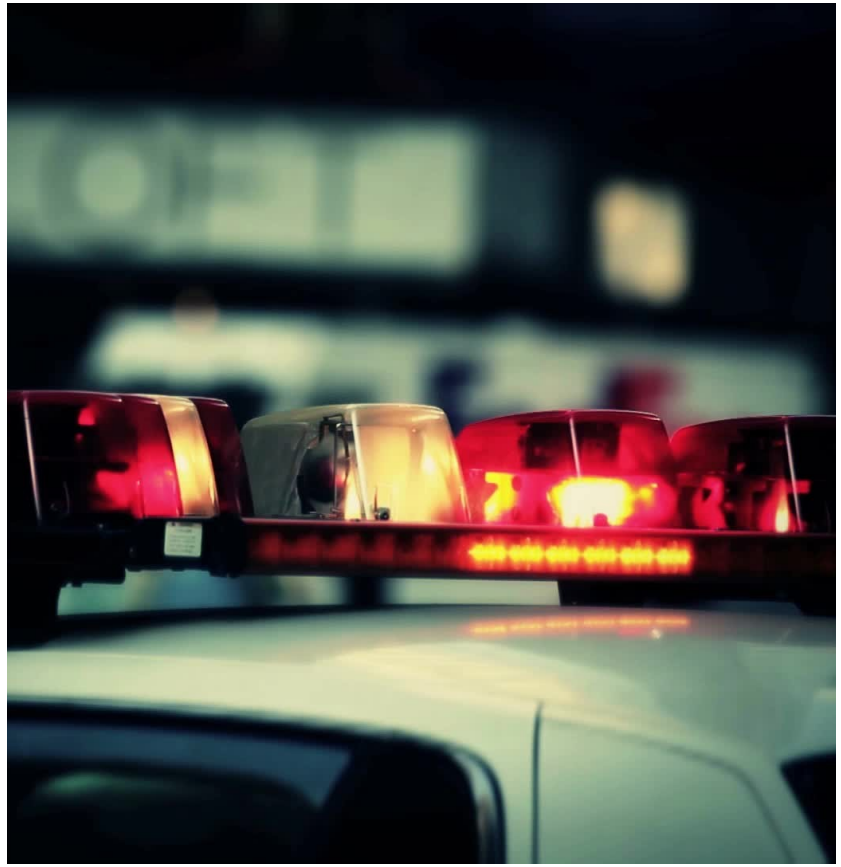
"Student Led Adult Learning"



Presenting Complaint

11-year-old male;

1. Loss of consciousness 22hours
2. Fever 4/7



Pre-hospital presentation and hand over



Transfer Details:



Community facility transfer.



Ambulance type C (ALS).

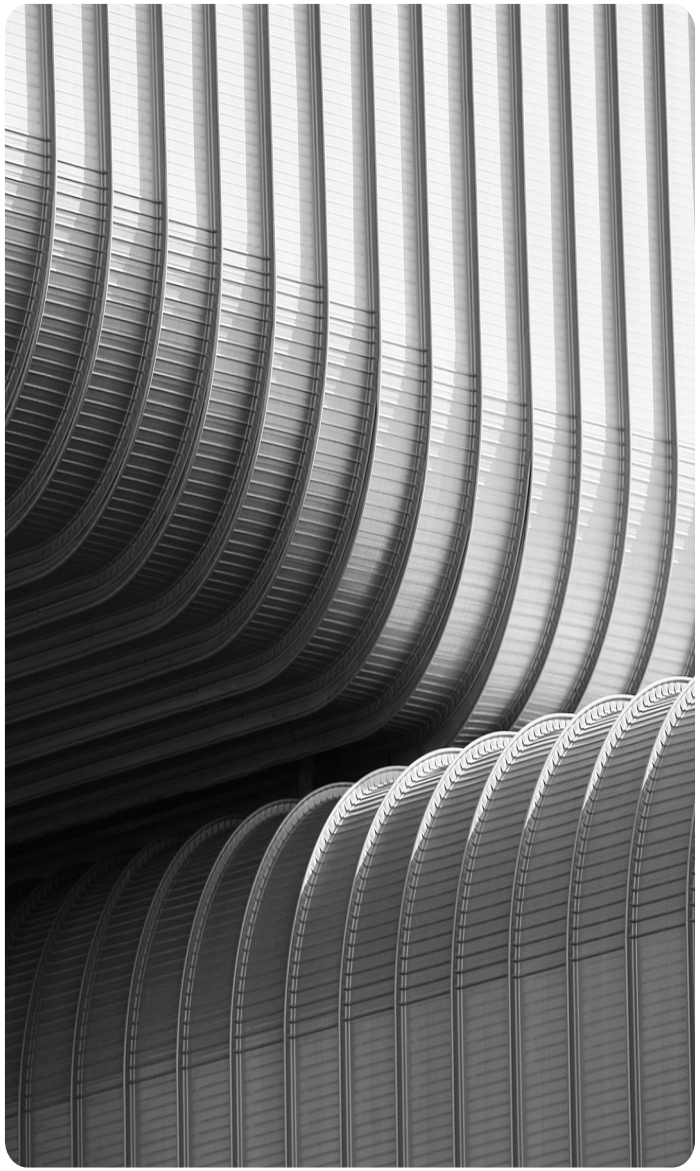


Crew: 2 EMTs, one an emergency driver

Equipment and Requirements:

- PPE
- Airway adjuncts (OPA, NG tube, LMA)
- Suction device
- Oxygen
- None Rebreather Mask (NRM)
- Diagnostics (stethoscope ,BP machine , thermometer, light pen)
- IV access
- IV fluids (Normal saline, Dextrose)
- Spine board

ISBAR REPORT



Identity: my name is Godwin Arinaitwe, an EMT in MOH ambulance department dispatched to the community to pick up an unconscious 11yrM

Situation: An 11yrM has been unconscious for 22hours , with generalized tonic clonic seizures, and a high-grade fever(42C)

Background: He has been previously managed for malaria at lower facilities with no improvement. Has been vomiting and passing tea colored urine

Assessment: Airway at risk(vomiting and unconscious), fast breathing (37b/m), warm peripheries, weak fast pulse, BP 98/68mmHg

Recommendation: NG tube to prevent aspiration, continuous oxygen therapy(10L via a NRM) 2 large bore IV cannulas with D5%. ICU admission, monitor for seizures, urine output. Do malaria b/s,brain CT scan, RFTs

Primary Survey

- **Airway:** was at risk because the patient was unconscious

- **Breathing:** intercostal muscle recessions,RR=37cycles/min SPO2=94% on 10L/min of O2 by NRM

- **Circulation:** warm extremities, capillary refill >3seconds BP=98/68 ,PR=182beats per min.

- **Disability:** I witnessed a single episode of generalized tonic clonic convulsion lasting for 10minutes, **RBS** 3.6mmol/L
- **Exposure :**warm extremities with temperature of 42°*c*, there was drooling of saliva, tongue biting and urine incontinence however, no pallor,

ED Intervention

- **Airway:** inserted an NG tube
- **Breathing**; was at 10L/ min O2 flow by NRM SPO2 88% then transferred to ICU for intubation
- **Circulation**:1L of dextrose 5% was given using 18-gauge canula
- **Disability**: IV phenobarbitone 500mg, IV ceftriaxone 2g
- **Exposure**; IV Paracetamol 1g ,inserted Foley catheter 12

SAMPLE history

SIGNS & SYMPTOMS:

- LOC, generalized tonic-clonic seizures X 1/7, non projectile vomiting, high-grade constant fever x 4/7

ALLERGIES: NONE

MEDICATIONS:

- artesunate(3 doses), paracetamol and phenytoin

PAST MEDICAL HISTORY:

- was managed for meningitis 9 months ago. Has had reduced hearing for 5 years, no other chronic illness. Immunization was completed.

LAST MEAL: 36 hours ago

EVENTS:

- He was fairy unwell for 4/7 being managed for malaria with no improvement. Prior to admission, he had 6 episodes of vomiting, tea colored urine of reduced volume, high grade constant fever that couldn't be relieved by tepid sponging or oral paracetamol.
- A week prior to admission he developed productive cough and flue which was managed with over-the-counter drugs

Audience

- Any additional information?



Expert



What are your initial thoughts?



What is you preparation and approach to this patient?

Secondary survey

- **HEAD AND NECK:** the neck was stiff however, no jaundice, pallor lymphadenopathy or distended veins.
- **CHEST:** The chest exam was grossly normal however; there were bilateral basal crackles heard on auscultation
- **CVS & ABDOMEN;** Normal
- **EXTREMITIES**; warm with no any injuries
- **SKIN**: Normal



- **NEUROLOGICAL:** GCS 6/15(E,2 V1,M3,)generalized hypotonia, reduced deep tendon reflexes but with normal muscle bulk.

What are your differential diagnoses for this patient?

Differential diagnoses

DDX	IN VIEW OF;
Meningitis	fever, neck stiffness and convulsions
Complicated Malaria	fever, convulsions, vomiting, passing of tea colored urine
Sepsis	fever, tachypnea, tachycardia and low blood pressure
Acute kidney injury	passing tea colored urine of reduced volume

Laboratory investigations

1. BS; No malaria parasites were seen
2. MRDT: negative
3. CSF analysis:
   - App: turbid
   - Wbc:180cells/UL(predominantly polymorphonuclear cells
   - Protein: positive
   - Gram stain: gram positive diplococci(+++)
   - Culture: results not yet ready



Biochemistry(RFTs, LFTs)

Chemistry	Result	Unit	Flag	Ref Range
ALT	119	U/L	H	0-40
AST	310	U/L	H	0-37
ALP	251	U/L		98-279
γ-GT	27	U/L		11-61
CREA	1.7	mg/dL	H	0.1-1.3
UA	8.5	mg/dL	H	3.4-7.0
UREA	76	mg/dL	H	10-55
AST/ALT	2.6			
Na+	146.8	mmol/L	H	134.0-146.0
K+	6.3	mmol/L	H	3.6-5.0
Cl-	110.1	mmol/L	H	89.0-109.0
TP	5.0	g/dL	L	6.6-8.7

CBC

Print ti

	Parameters		Result	Unit	Ref. range
1	**WBC**		**4.51**	**10^9/L**	**4.30-11.30**
2	Neu%	H	74.3	%	31.0-70.0
3	Lym%	L	17.2	%	23.0-59.0
4	Mon%		7.6	%	2.0-11.0
5	Eos%		0.7	%	0.0-9.0
6	Bas%		0.2	%	0.0-1.0
7	Neu#		3.36	10^9/L	1.60-7.80
8	Lym#	L	0.77	10^9/L	1.50-4.60
9	Mon#		0.34	10^9/L	0.13-0.76
10	Eos#		0.03	10^9/L	0.00-0.68
11	Bas#		0.01	10^9/L	0.00-0.07
12	IG%		3.4	%	
13	IG#		0.15	10^9/L	
14	**RBC**		**5.43**	**10^12/L**	**4.20-5.70**
15	**HGB**		**14.4**	**g/dL**	**11.8-15.6**
16	HCT		0.416		0.360-0.460
17	MCV	L	76.7	fL	77.0-92.0
18	MCH		26.5	pg	25.0-34.0
19	MCHC		34.5	g/dL	31.0-35.5
20	RDW-CV		15.8	%	11.0-16.0
21	RDW-SD		42.5	fL	35.0-56.0
22	**PLT**	L	**132**	**10^9/L**	**167-453**
23	MPV		9.6	fL	
24	PDW		14.6	fL	
25	P-LCR		25.6	%	
26	P-LCC		34	10^9/L	
27	PCT		**0.127**	**%**	

Expert opinion?



Any additional thoughts at this point?



Any additional info you would want to get?

Expert

Pearls and pitfalls

Working diagnosis

- Sepsis
- Bacterial meningitis
- Hyperkalemia
- Acute kidney injury

Management plan

- Patient was intubated; BP 86/35mmHg, PR 152,SPO2 89%
- IV phenobarbital 180mg tds
- IV ceftriaxone 2g 12 hourly
- IV paracetamol
- IV soluble insulin 3.7iu and calcium gluconate
- 1L Normal saline(1ml of norepinephrine in 500ml of NS)



Prognosis

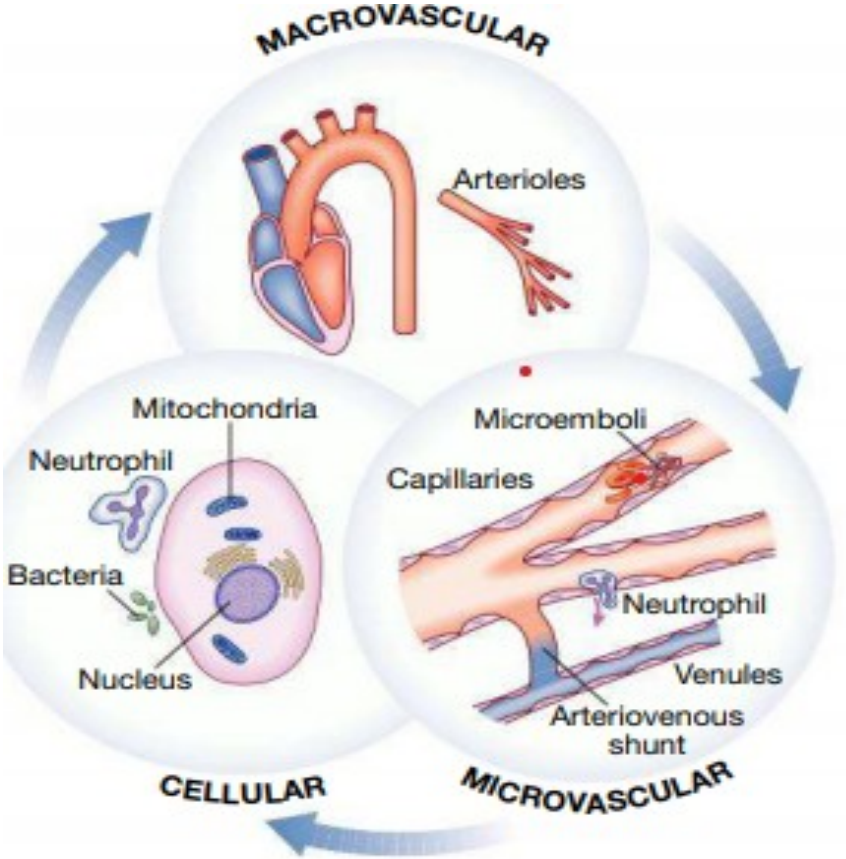
- Patient continued deteriorating irrespective of the interventions and unfortunately passed on after 10 hours of care
- MHSRIP
- Cause of DEATH??

TAKE HOME; SEPSIS

Sepsis is a defined as life-threatening organ dysfunction due to infection

- Septic shock = sepsis + hypotension requiring vasopressors + lactate ≥2
- Early recognition and early treatment reduces mortality
- Screening tools include the qSOFA, SIRS, SOFA, NEWS.
- RISK FACTORS;

PATHOPHYSIOLOGY



SEPSIS SCREENING

SIRS Criteria

SIRS(systemic inflammatory response syndrome) is a sepsis screening tool.

SIRS is diagnosed ***when 2 or more of the following are present***

- *Temperature >38 degrees Celsius or <36 degrees Celsius*
- *Heart rate >90 beats per minute*
- *Respiratory rate >20 cycles per minute*
- *WBC>1200/<4000 or bands >10%*

qSOFA (quick SOFA)

Rapid bedside screening tool used outside the ICU to identify patients with suspected infection who may have poor outcomes from sepsis.

- *Respiratory rate ≥ 22/min*
- *Altered mentsal state(GCS≤ 15)*
- *Systolic BP≤ 100Hg*

3 parameters each scoring 1
Score ≥2 → High risk of sepsis and poor outcome

MANAGEMENT

SEPSIS 1-HOUR BUNDLE

1) **Antibiotics**
   - Take cultures first
   - Start broad spectrum within 1 hour and de-escalate later
2) **Fluids**
   - rapid IV infusion with balanced crystalloids
   - About 30 mL/kg in small repeated boluses
3) **Vasopressors**
   - If MAP < 65 after fluids
   - Norepinephrine = first line, add vasopressin if needed
4) **Oxygen / Ventilation**
   - Target SpO_2 94–98%
   - Low tidal volume if ventilated
5) **Measure lactate levels**

Additional Supportive management

- LMWH for DVT prophylaxis
- Insulin to keep glucose 144–180 mg/dL
- Hydrocortisone; if shock is refractory to vasopressors
- Dialysis ;only if AKI with indications
- Bicarbonate ;if severe acidosis (pH < 7.1)
- PPIs for stress ulcer prophylaxis
- Avoid fluid overload

Complications of sepsis

- Septic shock
- Acute respiratory syndrome
- Acute kidney injury
- Disseminated intravascular coagulation
- Liver failure
- Meningitis

REFERENCES

- Surviving Sepsis Campaign guidelines,2021
- 2023 update on sepsis and septic shock; Matteo Guarino et al
- WHO Global Sepsis Report 2020
- UpToDate
- Medscape
- Davidson’s principles and practice of medicine 24th edition